

girder as if the girder was level. After adjustments for the displacements were made, the final applied load versus total deflections plot was then developed which is shown in Figure 5.1. It can be seen that the cracking load was at 663 kN (149 kips) and the ultimate load was at 850 kN (191 kips). Under the dead load of the girder, *Response 2000* predicted the camber as 28.2 mm (1.11 in.). Including this camber, the total displacement at failure was 113 mm (4.43 in.). At the ultimate load during the test, the actual girder deflection was measured as 126 mm (4.96 in.).

5.2.3 Comparisons of Experimental and Analytical Results

Figure 5.1 shows a good comparison between the load versus displacement curves obtained from the test and from the full member response analysis by *Response 2000*. Initially, the experimental curve shows a slightly greater stiffness than the theoretical curve because the tension stiffening effect of the concrete between the cracks. However, the experimental curve loses linearity much sooner than the theoretical curve, possibly because of the effect of fatigue loading. Regardless, the girder fails at a slightly greater load than that predicted by the computer model. Table 5.2 shows the predicted and experimental results of the girder at flexural cracking and ultimate load.

Table 5.2 Comparisons for Cracking and Ultimate Loads

Method	Cracking Moment	Cracking Load	Ultimate Moment	Ultimate Load
	(ft-kips)	(kips)	(ft-kips)	(kips)
Experimental	2,315	125	3,590	204
<i>Cracked Beam Analysis</i>	2,254	121	3,284	185
<i>Response 2000 – Sectional</i>	2,373	129	3,345	189
<i>Response 2000 – Full Member</i>	2,702	149	3,377	191

Note: 1 kip = 4.448 kN; 1 ft-kips = 1.355 kN-m